What is claimed is:

1. A method of polymer extrusion, comprising the steps of:

providing an extruder having an extrusion head;

extruding an elongate polymer member;

solidifying the elongate polymer member; and

rotating the elongate polymer member downstream of the extrusion head prior to solidification in order to impart molecular helical orientation to the elongate polymer member.

2. A method of polymer extrusion as in claim 1, wherein the step of rotating the polymer member downstream of the extrusion head is performed in close proximity to the extrusion head such that the molecular helical orientation is imparted to the elongate polymer member in a molten state.

3. A method of polymer extrusion as in claim 2, wherein the polymer member is formed of a polymer having a melting temperature and a glass transition temperature, and wherein the step of rotating the polymer member downstream of the extrusion head is performed in close proximity to the extrusion head such that the molecular helical orientation is imparted to the elongate polymer below the melting temperature.

4. A method of polymer extrusion as in claim 3, wherein the step of rotating the polymer member downstream of the extrusion head is performed in close proximity

to the extrusion head such that the molecular helical orientation is imparted to the elongate polymer above the glass transition temperature.

5. A method of polymer extrusion as in claim 4, wherein the elongate polymer member is extruded at 10 fpm or more and rotated at 1000 rpm or more.

6. A method of polymer extrusion as in claim 5, wherein the elongate polymer member is rotated at 3500 rpm or more.

7. A method of polymer extrusion as in claim 5, wherein the elongate polymer member is rotated at a variable speed to vary the molecular helical orientation imparted to the elongate polymer member.

8. A method of polymer extrusion as in claim 4, wherein the step of extruding the elongate polymer member comprises co-extruding two or more polymers.

9. A method of polymer extrusion as in claim 8, wherein the step of co-extruding two or more polymers comprises intermittently co-extruding two or more polymers.

10. A method of polymer extrusion as in claim 8, wherein the step of co-extruding two or more polymers comprises continuously co-extruding two or more polymers.

11. A method of polymer extrusion as in claim 4, wherein the elongate polymer member is extruded over a core member.

12. A method of polymer extrusion as in claim 11, wherein the core member is rotated with the elongate polymer member.

13. A method of polymer extrusion as in claim 12, wherein the core member is removed from the polymer member.

14. A method of polymer extrusion as in claim 4, further comprising the steps of:

feeding the elongate polymer member back into the extruder as a core member;

extruding a second elongate polymer member over the core member;

solidifying the second elongate polymer member; and

rotating the second elongate polymer member downstream of the extrusion head prior to solidification in order to impart molecular helical orientation to the second elongate polymer member.

15. A method of polymer extrusion as in claim 14, wherein the second polymer member is rotated in a different direction than the first polymer member.

16. A medical device comprising an elongate polymer member made by an extrusion process including the step of rotating the polymer member after extrusion but

prior to solidification while the polymer member is still in a molten state to impart a molecular helical orientation to the polymer member.

17. A medical device as in claim 16, wherein the elongate polymer member has a surface and a body, and wherein the molecular helical orientation extends through the surface and the body.

18. A medical device as in claim 16, wherein elongate polymer member is made by a co-extrusion process of two or more different polymers.

19. A medical device as in claim 18, wherein elongate polymer member is made by an intermittent co-extrusion process of two or more different polymers such that a proximal portion of the elongate polymer member comprises a first polymer and a distal portion of the elongate polymer member comprises a second polymer.

20. A medical device as in claim 18, wherein elongate polymer member is made by a continuous co-extrusion process of two or more different polymers such that the elongate polymer member comprises two or more coextending helically oriented polymers .

21. A medical device as in claim 16, wherein the molecular helical orientation comprises 100 rotations per foot or more.

22. A medical device as in claim 21, wherein the molecular helical orientation varies as a function of length of the elongate tubular member to impart variable flexibility.

23. A medical device as in claim 16, wherein the medical device comprises a guide wire and the elongate polymer member forms a shaft of the guide wire.

24. A medical device as in claim 16, wherein the medical device comprises a catheter and the elongate polymer member forms a tubular shaft of the catheter.

25. A medical device as in claim 16, wherein the medical device comprises a balloon catheter and the elongate polymer member forms a balloon of the balloon catheter.

26. A medical device as in claim 16, wherein the medical device comprises a balloon catheter and the elongate polymer member forms a balloon sleeve of the balloon catheter.

27. A medical device comprising an elongate polymer member having a molecular helical orientation formed by rotation immediately after extrusion thereof.